Triaging the Injured Worker

Rehab Principles Following Rotator Cuff Repair, Distal Biceps Repair, & Tennis Elbow

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HAND to SHOULDER CENTER of wisconsin

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Objectives

- Describe the progression of rehabilitation following rotator cuff and distal biceps repair
- Identify key impairments to address with tennis elbow which include musculotendinous and joint involvement

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Rehab Principles following Rotator Cuff Repair

POST-OPERATIVE REHAB PROGRAMS

- Early motion
  - Typically begins 3 days following surgery with passive motion
- Immobilization
  - Patients start therapy 4-6 weeks following surgery

Keener JD, Galatz LM, Stobbs-Cucchi G, et al. Rehabilitation following arthroscopic rotator cuff repair: a prospective randomized trial of immobilization compared with early motion. J Bone Joint Surg Am. 2014;Jan 1;96(1):11-19.

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Rehab Principles following Rotator Cuff Repair

PROTECTION

- Shoulder immobilizer
  - 4-6 weeks for the Early Motion program
  - 6-8 weeks for the Immobilization program
- Patients wear this during the day and at night, removing it to perform their exercises 3-5x/day

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Rehab Principles following Rotator Cuff Repair

PASSIVE RANGE OF MOTION (PROM)

- This begins on post-op day 3 or 4-6 weeks later, dependent on the protocol being followed
- Passive shoulder motion in supine or sitting, using uninvolved arm to provide support
- Patients perform this 3-5x/day

Passive Shoulder Flexion

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Rehab Principles following Rotator Cuff Repair

PASSIVE RANGE OF MOTION (PROM)

- Focusing on flexion, abduction and external rotation

Passive Shoulder Flexion

Passive Shoulder Abduction

Passive Shoulder External Rotation

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Rehab Principles following Rotator Cuff Repair

ACTIVE-ASSISTIVE RANGE OF MOTION (AAROM)

- The surgical arm then begins to assist with the motion, avoiding compensatory motion

Active-Assistive Shoulder Flexion in Supine

AA Shoulder Flexion along Doorframe

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Rehab Principles following Rotator Cuff Repair

POSTURAL RE-EDUCATION

- Scapular retraction
- Initiation of scapular retraction is helpful for postural re-education and recruitment of the middle trap and rhomboid muscles

Active Scapular Retraction

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Rehab Principles following Rotator Cuff Repair

POSTURAL RE-EDUCATION

- Sometimes tape can be used to improve scapular alignment and re-training

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Rehab Principles following Rotator Cuff Repair

SUB-MAXIMAL ISOMETRICS

- Gradual recruitment of the rotator cuff in a pain-free range

Isometric Shoulder Internal Rotation

Isometric Shoulder External Rotation

Isometric Shoulder Abduction

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Rehab Principles following Rotator Cuff Repair

PROGRESSION TO ACTIVE RANGE of MOTION (AROM)

- As patient's active shoulder motion in standing begins, it is critical to avoid cervical muscle compensation
- This pattern of motion may have been present prior to surgery

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Rehab Principles following Rotator Cuff Repair

PROGRESSIVE SCAPULAR STABILIZER STRENGTHENING

- Supine Alphabet Exercise
- This is a great way to "wake up" the scapular stabilizers without cervical muscle compensation before working against gravity

Alphabet Exercise

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Rehab Principles following Rotator Cuff Repair

SCAPULAR STABILIZER STRENGTHENING

- **Goal:** Emphasize serratus anterior (SA), lower trap (LT), and middle trap (MT)

PNF D2 Flexion with Resistive Band

Pull-Aparts with Resistive Band

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Rehab Principles following Rotator Cuff Repair

SCAPULAR STABILIZER STRENGTHENING

- Start in supine
- Progress to standing, insuring proper body mechanics (avoidance of cervical muscle compensation)

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Rehab Principles following Rotator Cuff Repair

ROTATOR CUFF STRENGTHENING

Sidelying External Rotation

- "Therapists should avoid prescribing patients with upper trap/lower trap imbalance exercises that include ER in standing due to excessive postural activation of the upper trap"

Sidelying Shoulder External Rotation

Cricchio M & Frazer C. Scapulothoracic and scapulohumeral exercises: a narrative review of electromyographic studies. J Hand Ther. 2011;24:322-334.

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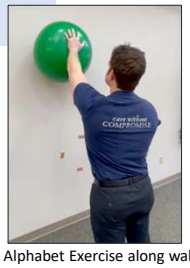
Rehab Principles following Rotator Cuff Repair

PROGRESSION WITH STRENGTHENING

- Focusing on rotator cuff and scapular stabilizer strengthening to prepare for full functional use

Wall Slides

Rebounder for Dynamic Control



Alphabet Exercise along wall

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Rehab Principles following Rotator Cuff Repair

PROGRESSION WITH STRENGTHENING

- Can further progress to higher level activities and weight-bearing to promote dynamic control to perform patient's specific work-related tasks

Partial Weightbearing

Full Weightbearing

Cable Column for Scapular Stabilizers

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Rehab Principles following Rotator Cuff Repair

Functional Reaching & Lifting

THERAPEUTIC ACTIVITIES

- Mimicking the patient's work-related tasks can further help to facilitate their recovery for returning to full-duty work
- This will be covered in more detail in the Work Conditioning presentation!

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Rehab Principles following Rotator Cuff Repair

SUMMARY

- Whether patients participate in the early motion or an immobilization post-operative program, the outcomes are similar
- With progressive shoulder motion, ensure the patient does not develop significant stiffness and focus on strengthening the appropriate muscles (rotator cuff and scapular stabilizers) to return to their work-related tasks

Keener JD, Galatz LM, Stobbs-Cucchi G, et al. Rehabilitation following arthroscopic rotator cuff repair: a prospective randomized trial of immobilization compared with early motion. J Bone Joint Surg Am. 2014;Jan 1;96(1):11-19.

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Trivia answer removed

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Rehab Principles following Distal Biceps Repair

- Safe and effective rehab following distal biceps repair is based on a phased progression with avoidance of premature stress on the healing soft tissue repair:
  - **PROTECTION**
  - **RANGE OF MOTION**
  - **PROGRESSIVE RESISTANCE**

Logan CA, Shahien A, Haber D, et al. Rehabilitation following distal biceps repair. Int J Sports Phys Ther. 2019;Apr 14(2):308-317.

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Rehab Principles following Distal Biceps Repair

PROTECTION

- 10-14 days following surgery: Post-op dressing and sling
- 2 weeks post-op: Long Arm Orthosis or Hinged Elbow Brace is worn for 6-10 weeks

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Rehab Principles following Distal Biceps Repair

AAROM with Elbow Flexion

RANGE OF MOTION

- 2 weeks post-op:
  - active-assistive range of motion (AAROM) into full flexion and gravity-assisted extension, progressing to full elbow extension by 6 weeks
  - full active range of motion
- Maintain shoulder, forearm, wrist, and hand active ROM

"Coupled" Active Elbow Motion

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Rehab Principles following Distal Biceps Repair

RANGE OF MOTION

- 6 weeks post-op: goal is full active ROM against gravity with full passive range of motion

Full Active Elbow Motion

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Rehab Principles following Distal Biceps Repair

PROGRESSIVE RESISTANCE

- 6 weeks post-op: initiate isometrics to deltoid, rotator cuff and biceps

Isometric Shoulder Abduction

Isometric Shoulder External Rotation

Isometric Elbow Flexion

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Rehab Principles following Distal Biceps Repair

PROGRESSION WITH RESISTANCE

- 12+ weeks post-op: initiate biceps isotonic strengthening
- Progress with strengthening in all planes

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Rehab Principles following Distal Biceps Repair

PROGRESSION WITH RESISTANCE

- Importance of scapular stabilizer strengthening

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Rehab Principles following Distal Biceps Repair

SUMMARY

- Ensure patient achieves full elbow motion, especially into extension
- Optimize the strength and stability of the entire upper extremity, including the rotator cuff and scapular stabilizers
- The ultimate goal of rehabilitation: to optimize the patient's function and their ability to return to their work and daily activities.

Logan CA, Shahien A, Haber D, et al. Rehabilitation following distal biceps repair. Int J Sports Phys Ther. 2019;Apr 14(2):308-317.

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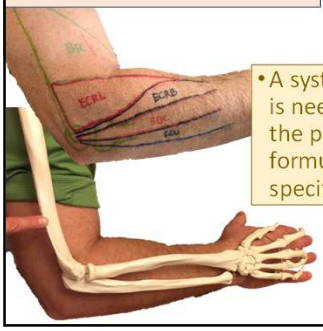
Rehab Principles for Tennis Elbow



- A systematic approach is needed to identify the pain generator to formulate a structure-specific plan of care

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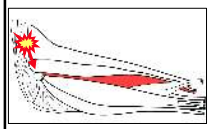
Rehab Principles for Tennis Elbow



MULTIPLE PAIN GENERATORS

- Musculotendinous (Extensor Carpi Radialis Brevis & Extensor Digitorum Communis)
- Humeroradial joint chondropathy
- Radial head hypermobility or hypomobility
- Lateral Ulnar Collateral Ligament laxity/instability

Stegink-Jansen C, et al. Lateral epicondylosis: a literature review to link pathology and tendon function to tissue-level treatment and ergonomic interventions. J Hand Ther. 2021:34(2):263-297.

Duparc F, et al. The synovial fold of the humeroradial joint: anatomical and histological features, and clinical relevance in lateral epicondylalgia of the elbow. Surg Radiol Anat. 2002 Dec;24(5):302-7.

Kwak SH, et al. Subtle elbow instability associated with lateral epicondylitis. BMC Musculoskeletal Disorders. 2018;19:136.

Sasaki K, Onda K, Ohki G, et al. Radiocapitellar cartilage injuries associated with tennis elbow syndrome. J Hand Surg. 2012;37A:748-754.

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Rehab Principles for Tennis Elbow

JOINT MOBILIZATION

- Improving the radial head mobility can decrease the tensile load on the wrist extensor muscles
- Patients can perform this as part of their home program

Lucado AM, Dale RB, Vicent J, et al. Do joint mobilizations assist in the recovery of lateral elbow tendinopathy? A systematic review and meta-analysis. J Hand Ther. 2019; Apr-June;32(2):262-276.

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Rehab Principles for Tennis Elbow

ECCENTRIC LOADING

- Systematic review found eccentric strengthening to be superior to other treatments at reducing pain and improving function" in the short-term, demonstrating large effect sizes.
- While all forms of strengthening are helpful, eccentric training is the most beneficial

Chen Z, Baker NA. Effectiveness of eccentric strengthening in the treatment of lateral elbow tendinopathy: A systematic review with meta-analysis. J Hand Ther. 2021. 34:18-28.

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Rehab Principles for Tennis Elbow

ECCENTRIC LOADING

- This can also be performed with a flex bar
- Optimal dosage with either a free weight or flex bar:
  3 sets of 15, 2 times per day

Tyler TF, Thomas GC, Nicholas SJ, et al. Additional of isolated wrist extensor eccentric exercise to standard treatment for chronic lateral epicondylosis: a prospective randomized trial. J Shoulder Elbow Surg. 2010;19:917-922.

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Rehab Principles for Tennis Elbow

PROPRIOCEPTIVE TRAINING

- Improving the patient's conscious and unconscious neuromuscular rehab will improve the patient's dynamic control for higher level activities

Stasinopoulos D. The role of proprioception in the management of lateral elbow tendinopathy. J Hand Ther. 2019;32(1):e5-e6.

Juul-Kristensen B et al. Poorer elbow proprioception in patients with lateral epicondylitis then in healthy controls: a cross-sectional study. J Shoulder Elbow Surg 2008;17:72S-81S.

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Rehab Principles for Tennis Elbow

PROXIMAL STRENGTHENING

- Improving the strength and endurance of the scapular stabilizers and rotator cuff muscles is critical to the success of patient returning to full functional use with performing their work-related tasks.

Day JM, Bush H, Nitz AJ, et al. Scapular muscle performance in individuals with lateral epicondylalgia. JOSPT. 2015;45(5):414-424.

Nabil BA, Ameer MA, Abdelmohsen AM, et al. The impact of tennis and golfer's elbow on shoulder external rotators and abductors peak torque. J Sport Rehabil. 2019;Apr 29:1-24.

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Rehab Principles for Tennis Elbow

SUMMARY

- With addressing lateral elbow pain, a systematic approach is needed to identify the pain-generator (muscle, joint, ligament or a combination) to formulate the patient's plan of care
- Rehab also should include the proximal musclature (rotator cuff and scapular stabilizers) as well a proprioceptive training to optimize patient's ability to return to work

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A special thanks to our model…

Dustin Atwood, Therapy Aide

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